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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/088,556	03/19/2002	Don Hee Lee	0465-0911P	6689
2292	7590	10/22/2003	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			LARKIN, DANIEL SEAN	
			ART UNIT	PAPER NUMBER
			2856	

DATE MAILED: 10/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
10/088,556

Applicant(s)
LEE et al.

Examiner
Daniel Larkin

Art Unit
2856



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE THREE (3) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-11, and 14-20 is/are rejected.
- 7) ☒ Claim(s) 5, 6, 12, and 13 is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 Mar 2002 is/are a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 2 6) ☐ Other:

Art Unit: 2856

DETAILED ACTION

Priority

1. Acknowledgment is made of Applicants' claim for foreign priority based on an application filed in Korea on 19 July 2000. It is noted, however, that Applicants have not filed a stamped copy of the Korea application from WIPO as is customary in U.S.C. 371 applications.

Drawings

2. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the use of a "thermal conductive film formed on each passivation film which is formed on each resistor of the absolute humidity sensor having a single substrate having a first cavity and a second cavity", as recited in claims 12 and 13 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

None of the drawing figures show a single substrate formed into two cavities having a thermal conductive film associated therewith. The use of the thermal conductive film, as shown in

Art Unit: 2856

Figures 3, shows a humidity sensor that has two humidity sensors each on their own respective substrate.

4. Applicants are required to submit a proposed drawing correction or corrected drawings in response to this Office Action. Drawing changes must be made by presenting replacement figures which incorporate the desired changes and which comply with 37 CFR 1.84. An explanation of the changes made must be presented either in the drawing amendments, or remarks, section of the amendment, and may be accompanied by a marked-up copy of one or more of the figures being amended, with annotations. Any replacement drawing sheet must be identified in the top margin as "Replacement Sheet" and include all of the figures appearing on the immediate prior version of the sheet, even though only one figure may be amended. Any marked-up (annotated) copy showing changes must be labeled "Annotated Sheet Showing Changes" and accompany the replacement sheet as an appendix to the amendment. The figure or figure number of the amended drawing(s) must not be labeled as "amended". If the changes to the drawing figure(s) are not accepted by the Examiner, Applicants will be notified of any required corrective action in the next Office action. No further drawing submission will be required, unless Applicants are notified.

Specification

5. The disclosure is objected to because of the following informalities:

Page 2, line 14: The term "of" should be corrected to read -- in --.

Art Unit: 2856

Page 2, lines 15 and 16: The second occurrence of the article “a” should be deleted; or the term “environment” or “atmosphere” should be inserted after the symbol “N₂”.

Page 3, line 7: The term “environment” or “atmosphere” should be inserted after the symbol “N₂”.

Page 3, line 8: The term “complicate” should be corrected to read -- complicated --.

Page 4, line 19: The term “on” should be corrected to read -- of --.

Page 5, line 13: The term “on” should be corrected to read -- of --.

Page 7, line 19: Reference designations “6a” and “6b” should be corrected to read -- 6A -- and -- 6B --, as shown in the drawing figures.

Page 7, line 25: Reference designations “8a” and “8b” should be corrected to read -- 8A -- and -- 8B --, as shown in the drawing figures.

Page 8, line 3: Reference designations “9a” and “9c” should be corrected to read -- 9A -- and -- 9C --, as shown in the drawing figures; and the term “and” should be corrected to read -- through --.

Page 8, line 73: Reference designations “10a” and “10b” should be corrected to read -- 10A -- and -- 10B --, as shown in the drawing figures.

Page 9, lines 6, 8, and 12: The term “insulating” should be corrected to read -- passivation -- since the summary of the invention as well as the claims both fail to use the term “insulating”.

Page 9, line 14: The term “of” should be corrected to read -- from --.

Art Unit: 2856

Page 10, line 16: Reference numeral -- 21 -- should be inserted after the term "sensor".

Page 10, line 19: Reference numeral -- 22 -- should be inserted after the term "sensor".

Page 11, lines 15, 17, and 21: The term "insulating" should be corrected to read -- passivation --.

Page 12, lines 9 and 13: Reference designations "6a" and "6b" should be corrected to read -- 6A -- and -- 6B --, as shown in the drawing figures.

Page 13, line 4: Reference numeral "45" should be corrected to read -- 43 --.

Page 13, lines 19 and 23: Reference designations "8a" and "8b" should be corrected to read -- 8A -- and -- 8B --, as shown in the drawing figures.

Page 14, lines 4, 9, and 14: The term "insulating" should be corrected to read -- passivation --.

Page 14, line 23: Reference numeral -- 62 -- should be inserted after the term "element".

Page 14, line 6: Reference designations "9a" and "9c" should be corrected to read -- 9A -- and -- 9C --, as shown in the drawing figures; and the term "and" should be corrected to read -- through --.

Page 14, line 10: Reference designation "9a" should be corrected to read -- 9A --.

Page 14, lines 14 and 24: Reference designation "9b" should be corrected to read -- 9B --.

Page 14, line 18: Reference designation "9c" should be corrected to read -- 9C --.

Art Unit: 2856

Page 16, lines 6 and 9: Reference designations "10a" and "10b" should be corrected to read -- 10A -- and -- 10B --, as shown in the drawing figures.

Page 16, line 24: The term "hold" should be corrected to read -- hole --.

Page 17, line 21: The term "of" should be corrected to read -- from --.

Page 18, line 1: The term "with" should be deleted.

Page 18, line 4: The article -- an -- should be inserted prior to the term "output".

Appropriate correction is required.

Claim Objections

6. Claims 6, 12, 13, and 18 are objected to because of the following informalities:

Re claim 6, claim line 2: The term "on" should be corrected to read -- of --.

Re claim 12, claim lines 2 and 3: The phrases "the passivation film" and "the resistor" lack antecedent basis.

Re claim 13, claim line 2: The term "on" should be corrected to read -- of --.

Re claim 18, claim line 5: The phrase "the electrode pads" lacks antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 2856

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-4, 7-11, and 14-17 are rejected under 35 U.S.C. 102(B) as being anticipated by EP 376721 (Sugihara et al.).

With respect to the limitations of claim 1, the reference to Sugihara et al. discloses a moisture-sensitive device comprising a substrate (1) having a cavity; a membrane/insulating layer (2) formed on the substrate (1); a resistor (4) formed on the membrane/insulating layer (2); electrode pads (6) formed on the membrane/insulating layer (2); and passivation/protective layer (5) is formed on the resistor (4).

With respect to the limitation of claim 2, the reference discloses that the membrane/insulating layer (2) may be comprised of a single film of SiO_2 or Si_3N_4 , see column 8, lines 16-21 and 35-39.

With respect to the limitation of claim 3, the reference discloses that the resistor is formed of platinum or nickel, see column 7, lines 29-32.

With respect to the limitation of claim 4, the reference discloses that the passivation/protective film is formed from an insulating material, such as Si_3N_4 , see column 9, lines 52-54.

With respect to the limitations of claim 7, the reference to Sugihara et al. discloses a moisture-sensitive device comprising a substrate (1b) having a first cavity and a second cavity, as

Art Unit: 2856

shown in the embodiment disclosed in Figures 5A and 5B; a membrane/insulating layer (2) on the substrate (1b); a humidity sensing element exposed to air, left portion of Figures 5A and 5B; and a temperature compensating element formed on the membrane/insulating layer (2), right portion of Figures 5A and 5B.

With respect to the limitation of claim 8, the reference states that each micro bridge element shown in Figures 5A and 5B is the same micro bridge element shown in Figure 1, see column 11, lines . Thus, each humidity sensor shown in Figures 5A and 5B comprises a resistor (3a, 3b) formed on the membrane/insulating layer (2); electrode pads formed on the membrane/insulating layer (2); and a passivation/protection layer formed on the entire surface of the resistor (3a, 3b), as shown above the resistors (3a, 3b) in Figures 5A and 5B.

With respect to the limitation of claim 9, the reference discloses that the membrane/insulating layer (2) may be comprised of a single film of SiO_2 or Si_3N_4 . Again, the reference discloses that the micro bridge element shown in Figures 5A and 5B is the same micro bridge element shown in Figure 1.

With respect to the limitation of claim 10, the reference discloses that the resistors (3a, 3b) are comprised of platinum, see column 11, line 32.

With respect to the limitation of claim 11, the reference discloses that the passivation/protective layer is the comprised of the same material used in the passivation/protective layer (5) of Figure 1. Again, this material component is Si_3N_4 .

Art Unit: 2856

With respect to the limitation of claim 14, the reference to Sugihara et al. discloses a further embodiment shown in Figures 6A and 6B. In this embodiment, the moisture-sensitive device is provided with a micro cap (8a) to cover the humidity sensing/detecting element (3a) and the temperature compensating/reference element (3b). The reference discloses that the micro bridge element shown in Figures 6A and 6B is the same micro bridge element shown in Figure 1.

With respect to the limitation of claim 15, the reference appears to show that the micro cap (8a) is provided with a hanging portion located in the center of the cap (8a) which acts to seal the humidity sensing element (3a) from the temperature compensating element (3b).

With respect to the limitations of claim 16, the reference discloses that the micro cap (8a) is provided with holes (11), as shown in Figure 6B to expose the humidity sensing/detecting element (3a) to the outside environment.

With respect to the limitation of claim 17, the reference discloses that the micro cap (8a) is made of silicon, see column 11, line 58 through column 12, line 1.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2856

10. Claims 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over in view of US 5,551,283 (Manaka et al.) and EP 21225 (Kitamura et al.).

With respect to the limitations of claim 18, the reference to Sugihara et al. fails to explicitly disclose how the electrodes of the humidity sensor are connected with an outside measuring apparatus or a shield case to surround the sensing elements of the humidity sensor. The reference to Manaka et al. discloses an atmosphere measuring device and flow sensor whereby the reference discloses that the prior art is well versed, as shown in Figure 3, in the technique of placing a temperature compensated sensing element (25) and a humidity sensing element (26) on a single sensing chip/substrate (24) each having a cavity for the respective sensing elements (25, 26). The two sensing elements (25, 26) are in turn contained within a cap cover (27) allowing one element (25) to act as a reference element and allowing the humidity sensing element (26) to sense the environment through a hole (28) located in the cap cover. The entire humidity sensing structure (20) is secured on a stem/base (22) having pins (29) electrically connecting the electrode pads of the sensing elements (25, 26) with the outside through the use of wires/leads. A seal cap is sealed to the base (22) to further enclose the sensing elements (25, 26). Sealing the sensing elements of Sugihara et al. to a base and providing further cover would have been obvious to one of ordinary skill in the art as evidenced by the prior art teaching. Additionally, the sealing feature and covering cap allows the sensor to work in a closed environment without have to worry about the environment affecting the reference element. The reference to Manaka et al. fails to disclose the material make up of the seal cap. The reference to

Art Unit: 2856

Kitamura et al. discloses a hygrometer whereby a sensing element (1) supported by a stem and having leads (4, 4') connected to the sensing element (1) is encased within a metal case (2) having holes (5) located therein. Providing a metal shield case would have been obvious to one of ordinary skill in the art as a means of providing additional protection to the humidity sensor.

With respect to the limitation of claim 19, the reference to Sugihara et al. discloses that holes may be formed at any arbitrary location including the junction of the cap and the substrate. The Examiner argues that the location of the hole is irrelevant to the functionality of the humidity sensor just as long as the hole provides the environment to only one of the two sensing elements.

With respect to the limitation of claim 20, the reference to Sugihara et al. fails to disclose the use of a shield case. The references to Manaka et al. and Kitamura et al. both provide holes in their respective shield casings. Providing a hole in the shield casing would have been obvious to one of ordinary skill in the art as a means of providing the humidity sensing element with the external environment in order to provide a measurement of this environment.

Allowable Subject Matter

11. The following is a statement of reasons for the indication of allowable subject matter:

Prior art was not relied upon to reject claims 5, 6, 12, and 13 because the prior art fails to teach and/or make obvious a thermal conductive film in combination with all of the limitations of the base claim.

Art Unit: 2856

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to Applicants' disclosure.

The prior art to GB 217299 (Dadachanji) discloses a humidity sensor having a temperature compensated element (10B) and an element (10A) exposed to the atmosphere.

The prior art to US 5,659,127 (Shie et al.) discloses the placement of a humidity sensor upon a stem (1) with pin passing through the stem to contact electrodes of the sensor. The gas sensor is enclosed within a casing having a gas entrance (37) is the casing to expose the sensor to the environment.

The prior art to US 5,388,443 (Manaka) discloses a humidity sensor having a temperature compensated element (13b) and an element (13a) exposed to the atmosphere. Each sensing element (13a, 13b) is provided on a single substrate (10) having cavities which have been etched underneath the respective sensing element (13a, 13b).

13. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Daniel Larkin whose telephone number is (703) 308-6724. The Examiner can normally be reached on Monday-Friday from 7:00 AM - 4:00 PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Hezron E. Williams, can be reached on (703) 305-4705. The FAX telephone number for this Technology Center (TC 2800, unit 2856) is (703) 872-9306.

Application/Control Number: 10/088,556

Page 13

Art Unit: 2856

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956.

Daniel Larkin

16 October 2003



DANIEL S. LARKIN
PRIMARY EXAMINER